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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,341	01/23/2004	Howard F. Fidel	3G-001US(PAR)	7079

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David Aker
23 Southern Road
Hartsdale, NY 10530

EXAMINER	
JAWORSKI, FRANCIS J	

ART UNIT	PAPER NUMBER
3737	

DATE MAILED: 04/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/763,341	FIDEL ET AL.	
	Examiner	Art Unit	
	Jaworski Francis J.	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02082005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26 and 27* is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☒ Claim(s) *18-25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner. (INFORMAL)

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02082005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 18 is objected to because of the following informalities: in association with the 'second probe' claiming, "plan" should be changed to -- plane --. . Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-17 are rejected under 35 U.S.C. 103 as being obvious over the combined teachings of Slayton et al (US5103129), Seward et a ((US6059731),

Barabash et al (US5860926 and 5842991) and the 'Hossack/Eaton et al/Sliwa Jr. et al/Hossack et al collection'. (US 6423002, 6511427,5876345 and 6045508) and Fujio et al (5471988).

Slayton et al in Figs. 1a, 8 and 10 and attending text proposes a biplanar structure in which the first and second (endoprobe) arrays are intersecting and may in fact both be convexly curved, see col. 4 lines 53-57. During fabrication as shown in Fig. 8 the array halves 71 associated with either the radially (convex) or longitudinally (linear or convex per the former statement) e may be separately fabricated.

Accordingly Slayton et al presents that the convex bi-planar array with discretely fabricated subsections was known, albeit in and of itself the sub-arrays are never functionally operated separately.

Barabash et al '991 teaches extended field of view by generally convexly oriented subarrays 10 along a first direction and planar arrays11 along a second direction. '991 incorporates as per col. 2 line 12 into the fast 3D imaging of the '926 patent.

Accordingly the Barabash et al set presents that crossed or orthogonal arrays in turn are operated as respective discrete transmit and receive subunits which may in turn be discrete plural arrays, albeit that the crossed arrays are operated together to perform the transmit/receive scanning foreacha single scanline.

Seward et al in Figs. 3 and 7 evidences that catheter extended field of view was contemplated using longitudinal and radial arrays in concert , see Figs. 3, 5, 7 where at

least two longitudinal arrays 56, 58 are functionally operated on opposite sides of the device as well as radial scanning C and/or forward convex scanning (52, 54, 48).

Accordingly Seward et al poses that an assemblage of radial arrays along a catheter tip as per Fig. 7 or alternatively characterized, a radial assemblage of parallel longitudinal arrays about a catheter tip result in subunit operations which include multiple longitudinal and radial element assemblages.

Sliwa et al which includes both external and in-body embodiments Figs. 1-2 incorporates both imaging and tracking arrays 401, 405 the latter of which may also be used for imaging. The principal imaging array may be curvilinear/curved/wide-view per col. 3 lines 46-67, and the tracking array may also be used for imaging see col. 9 top. (The ancillary force or pressure-measuring arrays are not of interest here as they are non-ultrasound.) Sliwa et al invoke the '002 and '345 patents, see col. 12 and 13 top portions which respectively ('002 Figs. 8 – 16, '345 Figs. 3-5 and 14, 16) include plural array configurations for the combined tracking-imaging or imaging-imaging applications. Related Hossack et al '508 shows additional variants Figs. 1-3, 5-10.

Accordingly the 'Sliwa et al ...collection' teaches that a longitudinal or longitudinally oriented principal imaging array may be used with one or plural orthogonal tracking ultrasound arrays which may also image, and in the geometry variants identified above.

Fugio et al Fig. 36 and col. 37 lines 48-53 establishes that an ultrasound array of imaging type may be orthogonally disposed to ultrasound phased arrays of therapeutic type in the case where therapy is contemplated concurrent to the imaging.

Accordingly Fugio et al teaches that orthogonal probe ultrasound array sets focused and targeted on the same area are known for the purpose of imaging the treated area.

The references are variously operated in the usual ultrasound diagnostic imaging ranges and in geometry sizing and convexities appurtenant to vascular or transesophageal catheter or endorectal use.and in conjunction with beam steering and multiplexing associated with plural array operation interleaving and focusing and gain control circuitry and digital conversion to video for display of the images.

Allowable Subject Matter

Claims 18 – 25 have been objected to for the minor informality in claim 18 but would be allowable upon correction of that informality.

Claims 26-27 are allowed..

Patentability Assessment

An exclusivity wording serving to define patentable claim language with respect to claims 1 – 17 is difficult at this juncture because the presence of five categories of relevant prior art (orthogonal arrays manufactured in discrete subunits, high-resolution crossed arrays, probe-tip 3D arrays, orthogonal imaging arrays with tracking and orthogonal imaging and therapy arrays of common focus) with each category invoking

a multiplicity of interrelationships therebetween necessitates that the categories be grouped together under their broadest characterizations and applied concurrently in order to advance prosecution efficiently and avoid a piecemeal or incomplete consideration of this art.

The following art was considered to be most relevant against claims 18 – 27:

Seo et al (US6685644), Martin et al (US5398691) and Sharp (US6120453) are all directed to composited 3D imaging using an external ultrasound imager which in the case of Seo et al is a volumetric imager and an internal radial or mechanically orientable 2D ultrasound scanner in conjunction with a spatial locator system with which to maintain positional registry between the internal and external ultrasound systems, and in all instances the probe/probe arrays are interconnectedly operated.. The internal scanner in these systems however is particularized to a single 2D array orientable under referencing by the spatial locator system and is not adaptable to multiple array use without disadvantageously undoing the adaptations.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

04202005

Francis J. Jaworski
Primary Examiner